IN THE SPECIFICATION

The paragraph beginning at page 1, line 12 of the substitute specification has been amended as follows:

Sensing of EMG-signals in a patient's diaphragm by placing a catheter with a number of electrodes in the esophagus is a known technique, which is described in, among others, United States Patent No. 5,671,752. The EMG-signals received can be used in connection with mechanical ventilation of patients, which among others is described in United States Patent No. 5, 820,560 and WO 98/48877.

The paragraph beginning at page 1, line 26 of the substitute specification has been amended as follows:

Since the EMG-signal from the diaphragm is relatively weak, in particular compared to interferences from EKG, a continuous desire is to in the best way attain the highest quality possible signal handling of the raw signal which the sensors detect. This is evident even in WO 01/03579. In WO 01/03579 it is assumed that the electrodes' location in relation to the center of the diaphragm is known. Then the electrodes are weighted based on location and symmetry, in which the EKG signal is taken into account in a ~~traditional~~ conventional way.

The paragraph beginning at page 2, line 15 f the substitute specification has been amended as follows:

An object of the present invention [[is]] is to provide a method and a device and a computer program product for measuring EMG signals that take into consideration that the location of the electrodes ~~location~~ varies during a measurement.

The paragraph beginning at page 4, line 26 of the substitute specification has been amended as follows:

Naturally an arbitrary number of ~~electrodes,~~ electrodes can be used and for n electrodes, n-1 signals are ~~allowed,~~ allowed, and thereby n-1 channels.

The paragraph beginning at page 4, line 28 of the substitute specification has been amended as follows:

More information regarding the catheter, the sensors and the entire process to capture raw signals from the diaphragm via esophagus can be found in e.g. United States Patent No. 5,671,752 and WO 01/03579. As already noted, electrodes connected outside the body can even be used instead, for ~~of~~ completely non-invasive ~~receiving~~ reception of EMG-signals.

The paragraph beginning at page 5, line 3 of the substitute specification has been amended as follows:

The patient 4 can also be connected in conventional ways to a ventilator system 18, which in turn can be connected to the device 2 via a suitable connection 20. The respiratory therapy given via the ventilator system 18 in that way can be influenced by the EMG-signal, which is extracted from the raw signal from the diaphragm 10. This influence can be done in many different ways, of which some are described in United States Patent No. 5,820,560 and WO 99/43374.

The paragraph beginning at page 6, line 11 of the substitute specification has been amended as follows:

The block 26 and 28 can be replaced with an adaptive band pass filter which is described in ~~our parallel~~ Swedish application 0303061-6 filed November 19, 2003 and corresponding to Serial No. 10/599,980 filed March 26, 2007 and assigned to

the same assignee as the present application, in connection ~~to figure~~ with Figure 6 in that application.

The paragraph beginning at page 6, line 23 of the substitute specification has been amended as follows:

In the next step, a summation is done in a summing unit 36. The purpose of the summing unit 36 is to weigh together the channels. This is done by multiplying the signals in the respective channels by a weight factor (see below), summing and normalizing the signals. In this connection the weighting factor can be squared to more selectively promote the channels with good signal-to-noise ratio. In principle, the summing unit 36 can be seen as a channel selector in which the channels that have the highest weighting factor are ~~cut out~~ selected for use while the channels with poorer SNR can be allocated the value 0 in extreme cases.

The paragraph beginning at page 7, line 17 of the substitute specification has been amended as follows:

In addition to the signals mentioned above, the first calculation block 40 and the second calculation block 42 have a further input signal, namely the signal after the rate limit block 34.

The paragraph beginning at page 7, line 20 of the substitute specification has been amended as follows:

The EKG detector 38 and the EMG detector 44 can be designed in different ways. In one formulation the EKG detector 38 is designed ~~to,~~ for each channel~~, that is,~~ and thus for each signal which is received from an electrode, to detect if the EKG signal exceeds a limit value which is defined for the EKG signals. To make this comparison the raw signal is filtered in a band pass filter to take away the relevant

frequency band for an EKG signal and the output signal from the band pass filter is compared with the set threshold. If the output signal is higher than the threshold the EKG signal is considered present.

The paragraph beginning at page 8, line 8 of the substitute specification has been amended as follows:

The function of the first calculation block 40 is evident from Fig. 5. The signal from the EKG-detector 38 goes into a first decision block 46. Here it is established whether an EKG-signal is present in one of the channels (output yes) or not (output no). If there is no EKG-activity, the activity level is set to 0 in block 48 (estimated EKG-activity = 0). If an EKG-signal is present in one of the channels, the estimated EKG-activity S is calculated for all the channels, which is done via a low pass filter 50, which also receives the filtered signal from the rate limit block 34. In the low pass filter 50, the D.C. ~~tension~~ voltage level for each channel is in principle determined, the filtered signal from rate limit block 34, (a breaking frequency of a few Hz can be accepted), which in that connection represents the estimated EKG-activity S.

The paragraph beginning at page 8, line 18 of the substitute specification has been amended as follows:

The function of the second calculation block 42 is explained in Fig. 6. The signal from the EKG-detector 38 goes into a second decision block 52. If an EKG-signal exists (output yes), the estimated EMG-activity is set to 0 in block 54. If no EKG-signal exists (output no), it is investigated whether there exists some EMG-signal (from the EMG-detector 44) in a third decision block 56. If no EMG-signal exists (output no), the activity is set to 0 in the block 54. If ~~there exist~~ EMG-signals

exist, the estimated EMG-activity R is calculated by passing the signal, the filtered signal from Rate limit block 34, through a low pass filter 58.

The paragraph beginning at page 9, line 19 of the substitute specification has been amended as follows:

As shown, the embodiments shown in ~~figures~~ Figures 5 and 6 can be seen as a special case of that shown in ~~figures~~ Figures 7 and 8, where the probability P_{ECG} can assume the value 0 or 1.

The paragraph beginning at page 10, line 6 of the substitute specification has been amended as follows:

The signal-to-noise ratio is transferred to a weighting factor block 62, where a weighing is determined for each channel. The determinations in the weighting factor block 62 are ~~apparent~~ shown in Fig. [[7]] 9. A time block 64 counts time ~~intervals~~ interval t, for example for a few seconds ~~long~~. In the example of Fig. 9, t must be longer than 2.5 seconds. During the respective time interval t, the maximum signal T1 is determined for the signal-to-noise ratio T from the SN-block 60 in a maximizing block 66. This maximum signal T1 is then filtered in a low pass filter 68. The filtered signal T2 then represents the base for the determination of a weighting factor for each channel in a calculation block 70. In this example, the weighting factor is set to

$$\frac{T2}{\max T2}$$

where maxT2 is the maximum T2 for all the channels. In other words, the channels are normalized to the strongest signal-to-noise ratio of all the channels, such that the weighting factor for the respective channel receives a value between 0 and 1.